



Do industry specialists and business risk auditors enhance audit reporting accuracy?

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Do Industry Specialists and Business Risk Auditors Enhance Audit Reporting Accuracy?

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ABSTRACT

A number of prior studies have examined audit reporting quality using size (Big 8/6/5/4) as a proxy for quality (i.e. Lennox, 1999b; Francis and Krishnan, 1999; Weber and Willenborg, 2003). In this paper we move beyond the traditional definition of a high quality auditor, and investigate whether enhanced industry knowledge or an increased focus on business risk auditing methodologies improve audit reporting accuracy. In addition, we examine whether industry specialists and business risk auditors have a comparative advantage in judging the adequacy of mitigating management actions implemented by financially distressed companies. Using a sample of US companies from manufacturing industries (SIC 20-39) that went bankrupt between 1998-2001, we do not find evidence supporting that specialist auditors are more likely to issue a going concern opinion for companies that subsequently go bankrupt. However, our evidence does indicate that specialists are not fooled by operating initiatives (whereas non-specialists are). Interestingly and counter to our expectations, we find that audit firms using a business risk methodology are less likely to issue a going-concern opinion for a firm that subsequently goes bankrupt. Further, our evidence also suggests that business risk auditors may be ‘fooled’ by short term operating efforts to reduce financial distress. Finally, we also find very strong evidence that auditors, irrespective of their type, are ‘fooled’ into not issuing a going concern opinion for clients that subsequently go bankrupt when the client is planning on raising cash in the short term.

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I. INTRODUCTION

A number of prior studies have examined audit reporting quality using size as a proxy for quality, specifically, Big 8/6/5 audit firms have been considered to be higher quality than other audit firms, i.e., so-called Big N firms. Francis and Krishnan (1999) find that Big N auditors are more likely to issue modified audit reports for high-accrual firms while Weber and Willenborg (2003) report that the pre-IPO audit opinions by large accounting firms are more predictive of post-IPO negative stock delistings. In a similar vein, Lennox (1999b) finds that Big 6 auditors issue more accurate audit reports than non-Big 6 firms. In this paper, we contribute to research focusing on the quality of auditor reporting by investigating the impact of industry specialisation and audit methodology on audit reporting accuracy. Audit firms have changed significantly in the past decade with respect to their structure and audit methodology. Consistent with these changes, we move beyond the "Big N" view of auditor differentiation and investigate other auditor traits that may be associated with differential audit reporting accuracy. More specifically, we investigate whether enhanced industry knowledge or an increased focus on business risk auditing methodologies improve audit reporting accuracy. In addition, we investigate the comparative advantage of industry specialists and business risk auditors in judging the adequacy of mitigating management actions implemented by financially distressed companies.

Using a sample of US companies from manufacturing industries (SIC 20-39) that went bankrupt between 1998-2001, we do not find evidence supportive of our hypothesis that specialist auditors are more likely to issue a going concern opinion for companies that subsequently go bankrupt. However, our evidence does indicate that non-specialist auditors are 'fooled' into not giving a going concern opinion by operating and strategic management initiatives undertaken by distressed clients, while auditors that are specialists are not fooled by operating initiatives. Interestingly and counter to our expectations, we find that audit firms

using a business risk methodology are less likely to issue a going-concern opinion for a firm that subsequently goes bankrupt. We also find that non-business risk auditors do not react to the presence of client initiatives to reduce financial distress. However, business risk auditors are less likely to issue a going concern opinion to a client that subsequently goes bankrupt if the client has undertaken operating initiatives. This suggests that business risk auditors may be ‘fooled’ by short term operating efforts to reduce financial distress.

The remainder of the paper is organized as follows: In the next section we discuss prior research on auditor reporting quality and develop our hypotheses. In the third section we discuss the approach to modelling we use, including the definition of the variables included in the analysis. In the fourth section, we describe the way in which we constructed our sample and report descriptive statistics for our variables. The fifth section presents our multivariate results, followed by a short summary and conclusion.

II. PRIOR RESEARCH AND HYPOTHESES

Although bankruptcy prediction is not the objective of an audit, the auditing profession has repeatedly been criticized for not providing early warning signals for impending client bankruptcy in the form of going concern modified audit reports (Raghunandan and Rama, 1995). From a financial statement user’s point of view, bankruptcies without a prior going concern report are often viewed as audit reporting failures (McKeown *et al.*, 1991; Chen and Church, 1992; Geiger and Raghunandan, 2002). The frequency that audit reports do not alert readers to impending bankruptcy has been extensively documented in prior research, which has generally shown that the proportion of bankrupt companies that receive a going concern audit opinion in the year immediately preceding bankruptcy is less than 50 percent (Geiger and Raghunandan, 2002; Raghunandan and Rama, 1995; Chen and Church, 1992). Prior research that investigated the reasons why auditors do not modify audit reports prior to bankruptcy focused on a variety of auditor and

client attributes such as auditor size, auditor tenure, the probability of bankruptcy, payments and covenant defaults, bankruptcy lag, and industry sector (e.g., McKeown *et al.*, 1991; Mutchler *et al.*, 1997; Lennox, 1999a and 1999b).

In the 1990s, large accounting firms started to structure their business around industry sectors and began to actively market their industry knowledge (Casterella *et al.*, 2004). In the same time period, many auditors developed new audit methodologies which focused on client business risk which emphasized auditors' knowledge of the client's business and industry (e.g., Bell *et al.*, 1997; Lemon *et al.*, 2000; Knechel, 2001). However, little is known about whether auditor reporting accuracy has been affected by the emphasis on industry specialization or the new audit methodologies, although there is ample research concerning the links between audit quality and industry specialisation (e.g., O'Keefe *et al.*, 1994; Owosho *et al.*, 2002; Balsam *et al.*, 2003; Low, 2004). Furthermore, recent research indicates that strategic information about a client can have a significant impact on the likelihood that an auditor issues a going concern report (Behn *et al.*, 2001; Geiger and Rama, 2003, Bruynseels and Willekens, 2006). The results of these studies raise the question whether this information has a positive impact on auditor report accuracy or, to the contrary, may be potentially deceptive regarding the true economic conditions of the client.

Audit reporting accuracy

Early research by McKeown, Mutchler, and Hopwood (1991) investigated why auditors often fail to modify the opinions of soon-to-be-bankrupt companies, and found that the likelihood of these reporting "errors" is larger when the probability of bankruptcy is lower, when the reporting lag is shorter, and when the client is larger. In a later study, Mutchler, Hopwood and McKeown (1997) also observed that extreme negative reports about a client that appear in the public media prior to an audit report significantly increase the likelihood of the client receiving a going concern opinion. Looking at UK data, Lennox

(1999a) noted that the economic cycle and industry sector are important predictors of bankruptcy, although they are not significant in the audit reporting model since auditors seem to be reluctant to give first-time qualifications (or to give clean opinions following qualified reports). Of direct interest to our study, Lennox (1999b) reported that the likelihood of an auditor not issuing a going concern opinion for a company that subsequently went bankrupt (sometimes referred to as Type II error), and the likelihood of the auditor issuing a going concern opinion for a company that actually survived (referred to as a Type I error), were both smaller for large audit firms when compared to small audit firms.

Prior research has also investigated the impact of changes in legislation, reporting requirements or the auditing environment on auditor reporting behaviour. Carcello *et al.* (1995) investigated the impact of the issuance of SAS No. 34 and SAS No. 59 on the propensity of large firms to issue going concern modified opinions. They report that audit firms were more likely to issue modified reports for subsequently bankrupt firms after the issuance of SAS no. 34, but not after the issuance of SAS no. 59. In contrast, Raghunandan and Rama (1995) found that after SAS no. 59 became effective, auditors were more likely to issue going concern modified opinions for financially stressed non-bankrupt companies and for bankrupt companies prior to failure. A more recent study of Geiger and Raghunandan (2001) examined the potential impact of the Private Securities Reform Act (enacted in 1995) which reduced the cost of litigation against auditors. Their results indicate that auditors were less likely to issue going concern modified audit reports for soon-to-be bankrupt companies after the Reform Act.¹

Industry Specialization

¹ Another interesting study by Geiger *et al.* (2005) investigates whether auditors were more conservative in their reporting after December 2001 (when the Enron story became public). They find evidence of a decrease in Type II reporting errors in the post-December 2001 period.

A growing body of research investigates the effect of auditor industry specialisation on the market for audit services and audit quality and has mainly focused on the relationship between industry specialisation and the pricing of audit services. Intuitively, higher quality audits might be expected to cost more so research has examined whether industry specialization is associated with higher audit fees. Initial evidence that this was the case was reported by Craswell *et al.* (1995) but more recent research has questioned whether this is still the case after the mergers that created first the Big 6 and then the Big 5 (Ferguson and Stokes, 2002). However, industry specialization may be a city-specific phenomena rather than a national phenomena as reported by Ferguson *et al.* (2003) and Francis *et al.* (2005). Research by Casterella *et al.* (2004) consider whether the development of a competitive strategy along the lines suggested by Porter (1985) leads to higher fees for industry specialization and find that price premiums do exist but only for smaller clients having low bargaining power.²

The fact that industry specialists can earn higher audit fees suggests that industry specialists may deliver higher audit quality. Earlier research by O’Keefe *et al.* (1994) reports that industry specialisation is associated with fewer violations of GAAS reporting standards. Wright and Wright (1997) confirm that industry specialists possess superior ability to generate alternative hypotheses when trying to identify accounting errors. Solomon *et al.* (1999) examine the knowledge of industry specialists and find that they have more insight into non-error explanations for unexpected ratio fluctuations in analytical procedures. Owosho *et al.* (2002) show that auditors working within their industry specialisation are more effective at detecting errors in staff working papers during the audit review process. Balsam *et al.* (2003) and Krishnan (2003) report evidence that auditors who are industry specialists

² Hay and Knechel (2006) also observe that the deregulation of advertising in New Zealand, as distinct from the deregulation of direct solicitation, led to increased Big 6 premiums as large firms used advertising to build the value of their brand name.

are associated with lower levels of earnings management. Furthermore, the incidence of fraud is lower (Carcello and Nagy, 2004), and the quality of corporate disclosure is better (Dunn and Mayhew, 2004) when a client's auditor is an industry specialist.

Research on the merits of auditor industry-specific experience suggests that auditors develop more extensive knowledge of the industry in which they specialize. Krishnan (2003) conjectures that specialist auditors are likely to develop databases detailing industry-specific best practices, industry-specific risks and errors, and unusual transactions, all of which can serve to enhance overall audit effectiveness. In line with this reasoning, the results of a study by Low (2004) suggest that industry-specialist auditors are likely to better recognize the audit risks associated with an engagement in that specific industry. Low (2004) further argues that this might be attributable to the fact that the enhanced knowledge of a client's industry enables auditors to benchmark the client performance against the industry. Since such knowledge is likely to be very useful for assessing the future viability of a client, industry specialists may reasonably be expected to make a more accurate assessment of the likelihood that a client will go bankrupt, leading to our first hypothesis:

HYPOTHESIS H1: *Ceteris paribus, the likelihood that an audit opinion is not modified for going concern reasons for a client that goes bankrupt within the next 12 months is lower for industry specialist auditors.*

Audit methodology and reporting accuracy

As previously mentioned, there has been a significant evolution in the audit methodologies of large accounting firms during the last decade. The new audit approaches, often referred to as business risk auditing, are based on a top-down, holistic perspective of the client and encourage the auditor to develop a thorough understanding of a client's business and related business risks (Bell *et al.*, 1997; Lemon *et al.*, 2000; Bell *et al.*, 2005; Knechel *et al.*, 2006). The business risk approach forces an auditor to determine the extent to which the

client's strategic objectives are being met (or not) and to assess the likelihood that the client will succeed in the future.

Several recent studies indicate that under certain conditions the business risk audit methodology may lead to greater audit effectiveness and efficiency (Kopp and O'Donnell, 2005; Choy and King, 2005; Erickson and Mayhew, 2000; Lemon *et al.*, 2000). More specifically, Lemon *et al.* (2000) investigate the evolution of audit methodologies applied by large accounting firms and find that many firms had undertaken a fundamental review of how problems arose in audit engagements. These firms stated that perceived audit failures are generally not caused by the ineffectiveness of audit procedures in detecting misstatements, but are the result of difficulties arising from other aspects of the business context (e.g., the impact of rapidly changing business environments, globalization and technological advances on the client's business). Based on this finding, we argue that a thorough analysis of the client's business could potentially decrease the likelihood of audit reporting errors because it may enhance auditors' ability to recognize going concern problems. In addition, Knechel (2002) supports this view and argues that going concern evaluations would greatly benefit from a broad examination of risk and risk management, as embedded in the business risk auditing methodology. This leads to our second hypothesis:³

HYPOTHESIS H2: *Ceteris paribus, the likelihood that an audit opinion is not modified for going concern reasons for a client that subsequently goes bankrupt within the next 12 months is lower for BRA auditors.*

Industry specialisation, strategic information and reporting accuracy

³ Other research suggests some problems with business risk audits. Ballou *et al.* (2004) and O'Donnell and Schultz (2005) argue that the performance of a strategic analysis may hinder professional scepticism. Specifically, Ballou *et al.* (2004) report small problems in business processes are under-weighted when the client's strategic positioning indicates that it is lagging behind industry norms. Furthermore, O'Donnell and Schultz (2005) find that auditors that assess client strategic risk to be favourable are less likely to adjust risk assessments for inconsistent fluctuations in accounts. While both these studies suggest a potential reduction in audit quality, the direct effect of the evidence is at the level of the risk of material misstatement of accounts, not the overall level of client viability. If these problems also extend to the assessment of going concern problems, than business risk auditing may lead to a reduction in the quality of auditor reporting.

Industry specialists are likely to possess a high level of knowledge of a client's industry and are likely to be better able to benchmark a client's financial performance against industry norms. Furthermore, industry specialist auditors are likely to develop databases detailing industry-specific best practices (Krishnan, 2003), allowing them to evaluate management's strategic and operating initiatives against best practices in the industry as well as industry trends and market needs. Based on this knowledge, industry specialists are also likely to have a better understanding of the external risks that might threaten the achievement of the company's strategic objectives and be able to judge whether the client's strategy has appropriately addressed external forces in the industry such as lifestyle trends, new entrants, regulation, technology, etc. In this respect, Biggs, Selfridge and Krupka (1993) argue that knowledge of the client's operations and industry and events in the client's environment is critical to understanding the causes of financial distress and evaluating management's plans to mitigate financial problems. Since many companies respond to signs of financial distress by undertaking new strategic or operating initiatives, the ability to judge the eventual success (or failure) of such initiatives is important to the assessment of going concern risk. An industry expert has a knowledge base on which to evaluate strategic and operating initiatives in response to financial distress, leading to our third hypothesis:

HYPOTHESIS H3: *Ceteris paribus, industry specialists are more likely to interpret non-financial strategic information correctly so the likelihood that an audit opinion is not modified for going concern reasons for a client that subsequently goes bankrupt within the next 12 months is lower.*

Audit methodology, strategic information and reporting accuracy

Under the business risk methodology, risk assessment typically starts with a strategic analysis of the client. This assessment comprises an analysis of the industry within which the client is operating, the client's strategy to achieve a sustainable competitive advantage, the business risks that threaten the success of this strategy, and the client's responses to these risks. As such, the auditor gains a thorough understanding of the adequacy and feasibility of

the company's strategy in light of the external business environment and client internal processes and resources (Bell *et al.*, 1997). If the auditor obtains a complete and accurate understanding of the dynamics of the client's business and industry, the auditor's knowledge base should be particularly helpful for evaluating the going concern risk of a client (Knechel *et al.*, 2006). In the situation where a client undertakes specific strategic or operating initiatives in response to a going concern problem, an auditor using a business risk methodology may be particularly well placed to evaluate the likelihood that those plans will succeed or fail, leading to our fourth hypothesis:

HYPOTHESIS H4: *Ceteris paribus, business risk auditors are more likely to interpret non-financial strategic information correctly, and therefore the likelihood that an audit opinion is not modified for a client that subsequently goes bankrupt within the next 12 months is lower.*

III. MODEL SPECIFICATION AND VARIABLE MEASUREMENT

Basic Regression Models and Dependent Variable

We examine the above hypotheses by developing a regression model to predict if an auditor issues a going concern opinion for companies that are financially distressed and eventually go bankrupt. We conduct our analyses in three stages. First, we estimate a base model of reporting accuracy that only contains financial variables shown by prior research to be associated with the likelihood of an auditor issuing a going concern report. These variables serve as control variables in subsequent analysis:

$$NO_GCO = f(\text{control variables}) \quad (1)$$

where NO_GCO is equal to 1 if the auditor does *not* issue a going concern opinion (i.e., an audit reporting "error"), zero otherwise. The results of this model are reported as Model 1 in our results section. Second, we examine the effect of industry specialists and auditors who use a business risk audit methodology on the likelihood of issuing a going concern report.

$$NO_GCO = f(\text{control variables, auditor type variables}) \quad (2)$$

We report the results of this model as Models 2 through 5 in our results section. Finally, we examine the interaction between different types of auditors and client initiatives in the face of financial distress.

$$\text{NO_GCO} = f(\text{control variables, auditor type variables, client action variables} \\ \text{auditor type variables*client action variables}) \quad (3)$$

We report the results of this model as Models 6, 7 and 8 in our results section.

Test Variables: Type of Auditor

We consider three different classification schemes for identifying audit firms that may be considered high quality. In our subsequent analysis, each category of auditor is tested individually. The first type of auditor we consider is based on the traditional definition of a high quality auditor, that is, Big N (8/6/5) firms. Consequently, we define BIG5 as equal to one if the auditor is a Big N firm, zero otherwise.

Second, we consider industry specialization as a source of audit quality. Prior research has used various measures of industry specialisation. Most of these measures are based on audit firm market share within a particular industry (e.g., Krishnan, 2003; Craswell *et al.*, 1995; Chen *et al.*, 2005; Ferguson and Stokes, 2002; Casterella *et al.*, 2004). The underlying reasoning is that firms with the largest market shares will develop a knowledge base within a particular industry and will make significant investments in developing industry-specific audit technologies (Neal and Riley, 2004). We classify auditors as industry specialists if they have a within-industry market-share of at least 25 percent. Prior to the consolidation of the Big 8 into the Big 6 in 1989, the auditor specialisation literature designated auditors as industry-specialists if they audited more than 10 percent of firms in the industry (e.g., Palmrose, 1984; Defond, 1992; Craswell *et al.*, 1995). After the consolidation, most auditor specialisation studies used a specialisation measure of 20 percent market share (e.g., Casterella *et al.*, 2004; Chen *et al.*, 2005; Neal and Riley, 2004; Dunn and Mayhew, 2004).

Because the data of this study is drawn from the years 1998-2001, with all observations after the 1998 PricewaterhouseCoopers merger, a more restrictive specialisation measure seems appropriate. The auditor's industry share is computed based on the square root of client sales within each two-digit SIC code using all companies available in Compustat for the period 1998-2001 (both Big 5 and non-Big 5 clients). We define SPECIALIST as equal to one if the company is audited by a Big N auditor with at least 25 percent market share in the industry, and zero otherwise.⁴ Tables 1a, 1b, 1c, and 1d summarize the Big 5 industry market shares for the 18 industries used in the study. Consistent with Francis *et al.* (2005), PricewaterhouseCoopers is the industry leader in more than half of the industries. Averaged across all years, PricewaterhouseCoopers is the national leader in 12 industries, Ernst & Young in 2.5 industries, Deloitte & Touche in two industries, and Arthur Andersen and KPMG are both the national leader in one industry.

<<<<< Insert Tables 1a, 1b, 1c and 1d about here >>>>>

Finally, we consider if a business risk auditor is associated with more accurate audit reports. Lemon, Tatum and Turley (2000) report substantial differences between audit firms regarding the implementation of business risk audit methodologies. Due to confidentiality agreements, they were unable to report the nature and extent of these variations. In a subsequent paper, however, Curtis and Turley (2005), provide more details about the diversity in the approaches of the Big 5 firms. Based on a series of practitioner interviews, they conclude that two of the firms adopted the business risk methodology to a greater extent than the other three. Issues that separated the two groups of firms involved the scope of business risks to be addressed, how such risks should be linked to the financial statements,

⁴ Using a cut-off of 25%, Knechel, Naiker and Pacheco (2006) report that firms switching from non-specialist Big 4 firms to specialist Big 4 firms have a 3-day cumulative abnormal return of 2.5% while firms switching from a specialist Big 4 firm to a non-specialist Big 4 firm suffer a 3-day cumulative abnormal loss of -3.5%. They interpret this evidence as suggesting that the market considers audit firms with an industry market share of 25% to be higher quality auditors.

the appropriateness of relying on high level controls, and the concept and implications of ‘significant risks’. In this study, we proxy for the differences between Big 5 audit firms with regard to the adoption of the business risk methodology by including a dummy variable, BRA, which is coded 1 if the company is audited by one of the two Big 5 firms that implemented the business risk audit methodology to a great extent, and 0 otherwise.

Test Variables: Client Strategic and Operating Initiatives

To test whether certain types of auditors perform better when confronted with non-financial information such as strategic and operating changes by a client, we include two variables to represent possible client reaction to financial distress, one for strategic actions and one for operating actions that were implemented during the year under audit. This categorization is based on research in corporate strategy, where the distinction between a strategic and operating turnaround approach was first introduced by Hofer (1980).⁵ Operating initiatives aim at a short-term improvement in financial performance through cost-cutting, asset disposal, increased marketing efforts and upgrading existing products and processes, whereas strategic initiatives aim at long-term profitability by solving external, strategic problems, e.g., entering into a strategic alliance or cooperative agreements. We only consider strategic initiatives which are likely to have a short term positive cash flow impact since the auditor’s decision about issuing a going concern report only considers the next 12 months of a client’s performance.⁶ Prior research has found that some operating initiatives lead to an increased likelihood of issuing a going concern opinion (Behn *et al.* 2001; Geiger and Rama, 2003; Bruynseels and Willekens, 2006), while strategic initiatives are associated with a reduced likelihood of receiving a going concern opinion (Bruynseels and Willekens, 2006).

⁵ For other strategy studies that adopt a similar classification, see also Robbins and Pearce II, 1992; Barker and Duhaime, 1997; Sudarsanam and Lai, 2001; Bruton *et al.* 2003.

⁶ In the strategy literature other strategic initiatives have been defined that may have a long-term impact, such as acquisitions and new product introductions.

The information regarding client operating and strategic initiatives was manually collected from the relevant 10-Ks filed with the SEC. Based on the analysis of the 10-Ks, we define OPERATING as a scaled discrete variable reflecting the number of operating initiatives implemented by the company during the year under audit. Specifically, we assessed whether the company engaged in: (1) cost-cutting activities, (2) asset disposal, (3) upgrading existing products and processes or (4) increasing marketing efforts. We then scored each company from 0 to 4 based on how many of these operating initiatives were undertaken during the year under audit. This score was then divided by the maximum score in the sample to scale it to a range of 0 to 1. With respect to strategic initiatives, we assessed whether the company entered into strategic alliances or cooperative agreements with other firms. We define STRATEGIC as equal to 1 if the company took such actions and 0 otherwise. In our testing below, we also consider the interaction of OPERATING and STRATEGIC with the various types of auditors to evaluate whether different types of auditors process this information differently.

Control Variables

Extensive prior research provides a rich set of potential control variables that may be associated with the likelihood that an auditor issues a going concern opinion (McKeown *et al.* 1991; Raghunandan and Rama 1995; Carcello *et al.*, 1995; Geiger and Raghunandan 2001; Gaeremynck and Willekens, 2003; Knechel and Vanstraelen, 2004). We include the following control variables to capture the underlying condition of the firm:

LNSALES	A measure of size, i.e., natural log of net sales.
ZSCORE	A measure of financial distress based on the Z-score developed by Zmijewski (1984).
DEFAULT	Dummy variable with a value of one if a company is in either payment default or technical default of loan covenants.
SQBNKLAG	The square root of days from the date of the audit report to the bankruptcy date.

RAISE\$ Prior audit opinion research has identified money-raising activities as a factor that may mitigate against issuing a going concern opinion (Behn *et al.*, 2001; Geiger and Rama, 2003). We construct our variable by assessing whether the client plans to (1) borrow funds through existing bank lines of credit or debt instruments and/or (2) issue equity through existing arrangements. The raw coding of these money-raising activities yields values of 0, 1 or 2, which is then scaled by the maximum score in the sample so as to fall in the range 0 to 1.

LNSALES and the data necessary to calculate ZSCORE were collected from the WORLDSCOPE database. SQBNKLAG and DEFAULT were derived from WORLDSCOPE database in conjunction with the company's 10-K. The information regarding client initiatives to raise money was manually collected from the relevant 10-K. A summary of all test and control variables is presented in Table 2.

<<<<< Insert Table 2 about here >>>>>

IV. SAMPLE AND UNIVARIATE TESTS

Sample selection

Because the purpose of this study is to shed some light on reasons an auditor does not issue a going concern report when a client subsequently goes bankrupt, our sample consists only of bankrupt companies. To start, we obtained a list of US public company bankruptcies for the years 1999 through 2002 by searching the Wall Street Journal Index and several other web-based resources⁷ under the heading “chapter 11” for those years. We restricted our sample to companies in manufacturing industries (SIC 20 to 39) to eliminate industry effects. This resulted in a sample of 127 manufacturing companies that went bankrupt in the period 1999 to 2002. Consistent with prior research, we also required that the company had received an audit opinion within the 12 months prior to bankruptcy (e.g., McKeown *et al.* 1991; Mutchler *et al.* 1997; Geiger and Raghunandan 2001). Furthermore, following

⁷ www.defaultrisk.com, www.BankruptcyData.com

Hopwood *et al.* (1994), we restricted the analysis to companies that exhibited at least two financial distress criteria.⁸ These requirements resulted in a sample of 102 companies: 14 from 1998, 16 from 1999, 45 from 2000, and 27 from 2001. One observation was subsequently identified as an outlier and removed from the sample, yielding a final sample of 101 firm observations as described in Table 3.

<<<<< Insert Table 3 about here >>>>>

Descriptive statistics and univariate results

Table 4 contains the descriptive statistics for the full sample of bankrupt companies, whereas Table 5 compares the descriptive statistics of the companies that went bankrupt and received a going concern opinion to those that did not receive a going concern opinion. Table 4 indicates that 26 percent of the companies in the sample are audited by a business risk auditor, and 31 percent of the companies are audited by a specialist auditor. Only 4 percent of the sample is audited by a specialist auditor who also uses the business risk methodology.

<<<<< Insert Tables 4 and 5 about here >>>>>

Table 5 reports the results of a t-test of differences between firms receiving going concern reports and those not receiving going concern reports. Companies that did NOT receive a going concern report (arguably an auditor reporting “error”) are larger (LNSALES, $p<.01$), are less likely to be in default (DEFAULT, $p<.01$), experience less financial distress (ZSCORE, $p<.01$), have a longer bankruptcy lag (SQBNKLAG, $p<.01$), and are more likely to disclose plans to raise money through additional borrowings or the issuance of stock (RAISE\$, $p<.01$). Of most interest, the univariate comparisons indicate that the variables

⁸ The financial distress criteria were specified as follows (see also, Chen and Church, 1992): 1) negative retained earnings, 2) negative operating income, 3) negative net income, 4) negative working capital, 5) negative net worth, and 6) negative operating cash flows.

representing strategic and operating initiatives do not differ between the two groups, nor do the variables for different types of auditor.

V. RESULTS

Multivariate Results

The results of the multivariate logistic analysis of auditor reporting ‘errors’ (i.e., not issuing a going concern opinion to companies that subsequently go bankrupt) are presented in Tables 6 and 7. In Table 6, we present the results of five regression models that we use to test hypotheses 1 and 2. Specifically, Model 1 provides the benchmark model without any of the test variables. The model has good explanatory power with a chi-square statistic of 67.61 and a McFadden R^2 of 0.49. Consistent with prior research, the results indicate that an auditor is more likely to incur a reporting “error” when the company is larger (LNSALES, $p<0.007$), has a lower probability of bankruptcy (ZSCORE, $p<0.001$), is not in default (DEFAULT, $p<0.008$), has a longer bankruptcy lag (SQBNKLAG, $p<0.002$) and has plans to raise money (RAISE\$, $p<0.002$).

<<<<< Insert Table 6 about here >>>>>

Next, Models 2 through 5 include our individual measures of auditor type: BIG5, SPECIALIST and BRA. Model 2 indicates that the likelihood of an auditor issuing a going concern opinion is not associated with whether the auditor is a Big 5 firm or not ($p<.5185$). Model 3 provides a test of our first hypothesis. The McFadden R^2 is 0.49 for this model. Since SPECIALIST is not significantly associated with the likelihood of a going concern report ($p<.9353$), the results do not support H1. Model 4 provides a test of our second hypothesis. The McFadden R^2 is 0.51 for this model. BRA is significant and positive ($p<.098$), which is counter to our expectations because it indicates that a firm using a business risk methodology are less likely to issue a going concern report for a firm that subsequently goes bankrupt (i.e., more likely to issue an “erroneous” report). Thus, H2 is

also not supported by the results. Model 5 indicates that this result is also observed if audit firms are classified by both industry specialization and business risk methodology, i.e., BRA continues to be positive and significant ($p < .0436$).

Also, it is interesting to note that regardless of the specification of the type of auditor, RAISE\$ is significant and positive in all models. This suggests that a client that appears able to raise cash in the short term is not likely to receive a going concern opinion no matter what type of auditor is conducting the engagement. This suggests that auditors are ‘fooled’ into not issuing a going concern opinion by this type of information. Note that this result also persists in subsequent tests (see Models 6, 7 and 8).

The results in Table 6 do not indicate whether auditors, particularly auditors using a business risk methodology, are influenced by the operating and strategic initiatives that a client may undertake. These tests are reported in Table 7. Model 6 tests the interaction between client actions and Big 5 auditors, Model 7 tests the interaction between client actions and specialists, and Model 8 tests the interaction between client actions and business risk auditors. The latter two models provide tests of hypotheses 3 and 4. However, it is interesting to note that RAISE\$ continues to be positive and significant in all models, suggesting that auditors place a lot of credence—possibly undeserved—on the ability of a company to raise cash as a mitigating factor against issuing a going concern opinion regardless of the type of auditor.

<<<<< Insert Table 7 about here >>>>>

In Model 6, we examine how Big 5 auditors are affected by the operating and strategic initiatives of a client in financial distress. The McFadden R^2 for the model is 0.53. Consistent with Model 2, BIG5 is not significant, nor is either measure of client initiatives (OPERATING, STRATEGIC) or the interaction of BIG5 with client initiatives. In short, we find no evidence that the likelihood of a Big 5 auditor issuing a going concern opinion for a

company that subsequently goes bankrupt is influenced by a client's operating or strategic actions.

In Model 7, we examine how industry specialists are affected by a client's operating and strategic initiatives. The McFadden R^2 for the model is 0.56. In this case, we see that the presence of client operating and strategic initiatives both increase the likelihood that an auditor will not issue a going concern opinion even though the company subsequently goes bankrupt (OPERATING, 4.01, $p < .0293$; STRATEGIC, 1.48 $p < .0665$). For auditor type, we see that the results are different from Model 3: SPECIALIST is now significant and positive (4.06, $p < .0746$). However, since one of the interactions involving SPECIALIST is also significant, the main effect can not be interpreted in isolation. Specifically, OPERATING*SPECIALIST is significant and negative (-6.35, $p < .0775$). Since the coefficient of the interaction exceeds the coefficient of SPECIALIST, the net effect is negative ($p < .05$). Taken together, these results suggest that non-specialist auditors are “fooled” into not giving a going concern opinion by operating and strategic initiatives of the client, while auditors that are specialists are not “fooled” by operating initiatives. However, this industry expertise does not seem to protect specialist auditors against misinterpreting the strategic initiatives any better than non-specialists (i.e., STRATEGIC*AUDITOR is not significant).

In Model 8, we examine how auditors who use a business risk methodology are affected by a client's operating and strategic initiatives. The McFadden R^2 for the model is 0.56. Interestingly, the insignificance of the main effects for OPERATING ($p < .945$) and STRATEGIC ($p < .7567$) suggests that non-BRA auditors do not react to the presence of client initiatives in general.⁹ Nor do the BRA auditors react to the presence of strategic initiatives

⁹ Since BRA is a dummy variable, the coefficients on the main effects can be interpreted as the effect of those variables on non-BRA auditors (BRA = 0). The effect on BRA auditors is then captured by the interaction terms when BRA = 1.

(STRATEGIC*BRA, $p < .542$). However, BRA auditors are less likely to issue a going concern opinion to a client that subsequently goes bankrupt if the client has undertaken operating initiatives (OPERATING*BRA, 5.76, $p < .088$). This results does suggest that business risk auditors may be “fooled” by short term operating efforts that appear to reduce financial distress. One possible interpretation of this result is that the analysis of client strategic viability *per se* may not be beneficial to auditor reporting accuracy. In other words, auditors may benefit only from client strategic analysis if they have adequate industry experience to also judge the adequacy of client strategic and operating initiatives.

Note that we also tested the interactions (not reported) between RAISE\$*AUDITOR. These were not significant in any of the specifications of AUDITOR. This suggests that high quality auditors, regardless of the specification as Big 5, industry specialist or business risk auditors, do not do a better job in interpreting financial information related to raising future cash. These findings are particularly interesting when linked to our results above regarding specialists, as this indicates that specialist auditors differentiate themselves from non-specialists in how they interpret operating initiatives to reduce financial distress, but are not able to do so in interpreting financial information related to raising future cash.

VI. CONCLUSIONS

In this paper, we examine the impact of various auditor type variables (i.e. big 5, audit auditor industry specialization and audit methodology) on going concern reporting accuracy. More specifically, we investigate whether enhanced industry knowledge or an increased focus on business risk auditing methodologies affect the auditor’s ability to identify failing companies. Additionally, we test whether these auditor characteristics are valuable in evaluating management initiatives to reduce financial distress. Using a sample of US companies from manufacturing industries (SIC 20-39) that went bankrupt between 1998-2001, we do not find evidence supporting that specialist auditors are more likely to issue a

going concern opinion for companies that subsequently go bankrupt. However, our evidence does indicate that non-specialist auditors are ‘fooled’ into not giving a going concern opinion by operating and strategic management initiatives undertaken by distressed clients, while auditors that are specialists are not fooled by operating initiatives. This evidence is consistent with higher audit quality provided by specialist auditors.

Interestingly and counter to our expectations, we find that audit firms using a business risk methodology are less likely to issue a going–concern opinion for a firm that subsequently goes bankrupt. We also find that non-business risk auditors do not react to the presence of client initiatives to reduce financial distress. However, business risk auditors are less likely to issue a going concern opinion to a client that subsequently goes bankrupt if the client has undertaken operating initiatives, such as cost cutting. This suggests that business risk auditors may be ‘fooled’ by short term operating efforts to reduce financial distress. Finally, we also find very strong evidence that auditors, irrespective of their type, are ‘fooled’ into not issuing a going concern opinion for clients that subsequently go bankrupt when the client is planning on raising cash in the short term. Linked to our results above, it seems that specialist auditors seem to do a better job in interpreting operating initiatives to reduce financial distress, but are not doing a better job in interpreting financial information related to raising future cash.

Overall, we find that specialist auditors per se do not have a beneficial impact on reporting accuracy but that audits performed by BRA auditors lead to lower (not higher) auditor reporting accuracy. A further refinement of the analysis indicates that the likelihood of reporting errors is higher when a client implements operating initiatives, *except* when the client is audited by an industry specialist, in which case the likelihood of reporting errors is *lower*. The results further also indicate that the likelihood of reporting errors is *higher* for a client that implements operating initiatives if the auditor adopts the business risk

methodology. Taken together the results suggest the possibility that an analysis of client strategic and operating initiatives may not be beneficial to audit quality, unless auditors have adequate industry experience to judge the adequacy of those initiatives.

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TABLE 1A: BIG 5 AUDITOR MARKET SHARES FOR SELECTED INDUSTRIES FOR 1998

Two-Digit SIC	Industry	Industry Market Shares				
		AA	EY	DT	KPMG	PW
20	Food and Kindred Products	0.12	0.15	0.13	0.20	0.34
22	Textile Mill Products	0.16	0.36	0.17	0.12	0.10
23	Apparel and Other Textile Products	0.20	0.25	0.21	0.03	0.16
24	Lumber and Wood Products	0.34	0.05	0.11	0.08	0.36
25	Furniture and Fixtures	0.24	0.09	0.08	0.13	0.36
26	Paper and Allied Products	0.22	0.14	0.15	0.13	0.28
27	Printing and Publishing	0.12	0.19	0.21	0.18	0.24
28	Chemicals and Allied Products	0.13	0.13	0.17	0.15	0.32
30	Rubber and Miscellaneous Plastic Products	0.20	0.22	0.10	0.09	0.33
31	Leather and Leather Products	0.00	0.30	0.13	0.21	0.21
32	Stone, Clay and Glass Products	0.26	0.22	0.15	0.10	0.21
33	Primary Metal Industries	0.13	0.24	0.13	0.03	0.41
34	Fabricated Metal Products	0.19	0.22	0.07	0.13	0.34
35	Industrial Machinery and Equipment	0.15	0.19	0.11	0.13	0.33
36	Electronic and Other Equipment	0.12	0.21	0.13	0.25	0.22
37	Transportation Equipment	0.11	0.18	0.23	0.12	0.31
38	Instruments and Related Products	0.15	0.22	0.12	0.11	0.32
39	Miscellaneous Manufacturing	0.12	0.15	0.27	0.13	0.21

AA: Arthur Andersen; EY: Ernst & Young; DL: Deloitte & Touche; KPMG: Klynveld Peat Marwick Goerdeler and PWC: PricewaterhouseCoopers

TABLE 1B: BIG 5 AUDITOR MARKET SHARES FOR SELECTED INDUSTRIES FOR 1999

Two-Digit SIC	Industry	Industry Market Shares				
		AA	EY	DT	KPMG	PWC
20	Food and Kindred Products	0.12	0.14	0.14	0.19	0.35
22	Textile Mill Products	0.15	0.37	0.16	0.13	0.11
23	Apparel and Other Textile Products	0.19	0.22	0.28	0.04	0.14
24	Lumber and Wood Products	0.33	0.10	0.13	0.09	0.31
25	Furniture and Fixtures	0.25	0.10	0.09	0.14	0.32
26	Paper and Allied Products	0.22	0.16	0.14	0.12	0.28
27	Printing and Publishing	0.13	0.22	0.16	0.20	0.23
28	Chemicals and Allied Products	0.14	0.13	0.17	0.15	0.32
30	Rubber and Miscellaneous Plastic Products	0.21	0.22	0.08	0.08	0.34
31	Leather and Leather Products	0.06	0.28	0.12	0.19	0.20
32	Stone, Clay and Glass Products	0.26	0.20	0.22	0.07	0.18
33	Primary Metal Industries	0.12	0.27	0.15	0.05	0.38
34	Fabricated Metal Products	0.19	0.21	0.08	0.11	0.34
35	Industrial Machinery and Equipment	0.15	0.18	0.12	0.16	0.33
36	Electronic and Other Equipment	0.11	0.19	0.13	0.26	0.25
37	Transportation Equipment	0.11	0.21	0.23	0.11	0.31
38	Instruments and Related Products	0.16	0.22	0.10	0.10	0.33
39	Miscellaneous Manufacturing	0.11	0.15	0.26	0.13	0.19

AA: Arthur Andersen; EY: Ernst & Young; DL: Deloitte & Touche; KPMG: Klynveld Peat Marwick Goerdeler and PWC: PricewaterhouseCoopers

TABLE 1C: BIG 5 AUDITOR MARKET SHARES FOR SELECTED INDUSTRIES FOR 2000

Two-Digit SIC	Industry	Industry Market Shares				
		AA	EY	DT	KPMG	PWC
20	Food and Kindred Products	0.12	0.14	0.10	0.22	0.37
22	Textile Mill Products	0.13	0.40	0.16	0.15	0.07
23	Apparel and Other Textile Products	0.19	0.25	0.25	0.04	0.14
24	Lumber and Wood Products	0.35	0.11	0.12	0.10	0.29
25	Furniture and Fixtures	0.26	0.08	0.09	0.11	0.33
26	Paper and Allied Products	0.14	0.20	0.16	0.16	0.29
27	Printing and Publishing	0.15	0.20	0.16	0.21	0.23
28	Chemicals and Allied Products	0.14	0.16	0.17	0.19	0.27
30	Rubber and Miscellaneous Plastic Products	0.18	0.21	0.11	0.13	0.30
31	Leather and Leather Products	0.06	0.27	0.13	0.19	0.21
32	Stone, Clay and Glass Products	0.27	0.22	0.25	0.10	0.09
33	Primary Metal Industries	0.12	0.24	0.13	0.03	0.45
34	Fabricated Metal Products	0.17	0.19	0.07	0.13	0.36
35	Industrial Machinery and Equipment	0.15	0.23	0.12	0.15	0.29
36	Electronic and Other Equipment	0.10	0.19	0.12	0.26	0.26
37	Transportation Equipment	0.13	0.20	0.25	0.11	0.29
38	Instruments and Related Products	0.14	0.24	0.09	0.11	0.35
39	Miscellaneous Manufacturing	0.13	0.11	0.24	0.10	0.20

AA: Arthur Andersen; EY: Ernst & Young; DL: Deloitte & Touche; KPMG: Klynveld Peat Marwick Goerdeler and PWC: PricewaterhouseCoopers

TABLE 1D: BIG 5 AUDITOR MARKET SHARES FOR SELECTED INDUSTRIES FOR 2001

Two-Digit SIC	Industry	Industry Market Shares				
		AA	EY	DT	KPMG	PWC
20	Food and Kindred Products	0.10	0.17	0.11	0.23	0.34
22	Textile Mill Products	0.10	0.44	0.09	0.18	0.08
23	Apparel and Other Textile Products	0.18	0.23	0.24	0.04	0.19
24	Lumber and Wood Products	0.32	0.13	0.12	0.07	0.32
25	Furniture and Fixtures	0.22	0.12	0.08	0.12	0.34
26	Paper and Allied Products	0.16	0.21	0.12	0.15	0.32
27	Printing and Publishing	0.14	0.22	0.14	0.21	0.23
28	Chemicals and Allied Products	0.14	0.14	0.16	0.16	0.32
30	Rubber and Miscellaneous Plastic Products	0.18	0.22	0.16	0.11	0.26
31	Leather and Leather Products	0.06	0.29	0.13	0.20	0.19
32	Stone, Clay and Glass Products	0.25	0.23	0.22	0.10	0.13
33	Primary Metal Industries	0.12	0.21	0.15	0.03	0.44
34	Fabricated Metal Products	0.17	0.22	0.08	0.11	0.36
35	Industrial Machinery and Equipment	0.14	0.27	0.11	0.14	0.29
36	Electronic and Other Equipment	0.11	0.20	0.11	0.25	0.25
37	Transportation Equipment	0.09	0.21	0.24	0.11	0.31
38	Instruments and Related Products	0.13	0.24	0.11	0.10	0.35
39	Miscellaneous Manufacturing	0.17	0.12	0.22	0.13	0.19

AA: Arthur Andersen; EY: Ernst & Young; DL: Deloitte & Touche; KPMG: Klynveld Peat Marwick Goerdeler and PWC: PricewaterhouseCoopers

TABLE 2: VARIABLE DEFINITIONS AND EXPECTED SIGNS

Variable	Definition	Expected sign
<i>Dependent variable</i> NO_GCO	1 if no going concern report was issued for a company that went bankrupt the subsequent year; 0 otherwise	
<i>Independent variables</i>		
<i>Auditor Size</i> BIG5	1 if the auditor is a Big 5 auditor	
<i>Audit Methodology</i> BRA	1 if the company is audited by a Big 5 auditor who adopted the business risk methodology, 0 otherwise	?
<i>Auditor Specialisation</i> SPECIALIST	1 if the company is audited by a Big 5 auditor who holds more than 25% market share (measured in square root of client net sales) in a two-digit industry, 0 otherwise	+
<i>Non-financial variables</i> OPERATING	A score from 0 to 4, scaled by its maximum value in the sample, representing the sum of all operating initiatives (marketing, asset disposal, upgrading of products and processes, cost-cutting)	-
STRATEGIC	Dummy variable which equals one if the company undertakes strategic initiatives with a short-term impact (cooperative agreements)	?
<i>Money-raising activities</i> RAISE\$	A score from 0 to 2, scaled by its maximum value in the sample, representing the sum of financial initiatives to raise money through the issuance of stock or additional borrowings	+
<i>Control variables</i> ZSCORE	probability of bankruptcy, calculated from the ZSCORE (1984) weighted probit bankruptcy prediction model	-
DEFAULT	1 if in payment default or technical default of loan covenants, 0 otherwise	-
SQBNKLAG	the square root of the number of days from the audit report date to the date of bankruptcy	+
LNSALES	natural log of net sales	?

TABLE 3: SAMPLE OF BANKRUPT COMPANIES PER TWO DIGIT INDUSTRY GROUPING

Two-digit SIC Code	Industry name	Number of Companies
20	Food and Kindred Products	5
22	Textile Mill Products	7
23	Apparel and Other Textile Products	4
24	Lumber and Wood Products	1
25	Furniture and Fixtures	1
26	Paper and Allied Products	4
27	Printing and Publishing	2
28	Chemicals and Allied Products	11
30	Rubber and Miscellaneous Plastic Products	2
31	Leather and Leather Products	1
32	Stone, Clay and Glass Products	5
33	Primary Metal Industries	6
34	Fabricated Metal Products	2
35	Industrial Machinery and Equipment	14
36	Electronic and Other Equipment	14
37	Transportation Equipment	11
38	Instruments and Related Products	7
39	Miscellaneous Manufacturing	4
		101

TABLE 4: DESCRIPTIVE STATISTICS

Variables	Mean	Median	St. Dev.	Minimum	Maximum
<i>Dependent variable</i>					
NO_GCO	0.45	0.00	0.50	0.00	1.00
<i>Independent variables</i>					
<i>Auditor type</i>					
BIG5	0.87	1.00	0.34	0.00	1.00
BRA	0.26	0.00	0.44	0.00	1.00
SPECIALIST	0.31	0.00	0.46	0.00	1.00
<i>Operating approach</i>					
OPERATING	0.51	0.50	0.24	0.00	1.00
<i>Strategic approach</i>					
STRATEGIC	0.36	0.00	0.48	0.00	1.00
<i>Money-raising activities</i>					
RAISE\$	0.26	0.00	0.30	0.00	1.00
<i>Control variables</i>					
ZSCORE	-0.51	-1.28	3.25	-5.29	14.87
DEFAULT	0.55	1.00	0.50	0.00	1.00
SQBNKLAG	13.95	15.00	3.85	4.36	19.08
LNSALES	11.74	12.14	2.56	0.00	15.61

TABLE 5: UNIVARIATE TESTS OF DIFFERENCES BETWEEN REPORTING ERROR FIRMS AND NON-REPORTING ERROR FIRMS

Variables	Firms receiving GCO (NO_GCO=0) (n=56)		Firms not receiving GCO (NO_GCO=1) (n=45)		Test of difference (t-statistic)
	Mean	Std. Dev.	Mean	Std. Dev.	
<i>Auditor Type</i>					
BIG5	0.86	0.35	0.87	0.32	0.47
BRA	0.25	0.44	0.27	0.45	0.19
SPECIALIST	0.27	0.45	0.36	0.48	0.94
<i>Operating approach</i>					
OPERATING	0.52	0.24	0.49	0.25	0.48
<i>Strategic approach</i>					
STRATEGIC	0.30	0.46	0.42	0.50	1.23
<i>Money-raising activities</i>					
RAISE\$	0.14	0.26	0.41	0.29	4.87***
<i>Control variables</i>					
ZSCORE	0.52	3.73	-1.79	1.87	4.05***
DEFAULT	0.71	0.46	0.36	0.48	3.82***
SQBNKLAG	12.51	4.07	15.74	2.67	4.80***
LNSALES	11.13	2.85	12.51	1.92	2.91***

* indicates significance at the .10 level (two-tailed)

** indicates significance at the .05 level (two-tailed)

*** indicates significance at the .01 level (two-tailed)

TABLE 6: LOGISTIC REGRESSION MODELS TESTING THE IMPACT OF AUDITOR TYPE ON TYPE II REPORTING ERRORS

Variables	Model 1			Model 2			Model 3			Model 4			Model 5		
	coeff	χ^2	p-value	coeff	χ^2	p-value	coeff	χ^2	p-value	coeff	χ^2	p-value	coeff	χ^2	p-value
C	-11.73	13.02	0.0003	-11.95	13.08	0.0003	-11.71	12.83	0.0003	-13.05	13.61	0.0002	-13.25	13.74	0.0002
LNSALES	0.57	7.23	0.0072	0.51	5.03	0.0250	0.57	6.81	0.0091	0.61	7.46	0.0063	0.61	7.10	0.0077
ZSCORE	-0.62	11.15	0.0008	-0.62	11.06	0.0009	-0.62	11.01	0.0009	-0.65	10.49	0.0012	-0.68	10.27	0.0014
DEFAULT	-1.75	6.97	0.0083	-1.75	6.99	0.0082	-1.75	6.89	0.0087	-2.16	8.46	0.0036	-2.25	8.98	0.0027
SQBNKLAG	0.29	9.23	0.0024	0.31	9.15	0.0025	0.29	9.21	0.0024	0.33	9.97	0.0016	0.32	8.86	0.0029
RAISE\$	3.52	9.48	0.0021	3.68	9.75	0.0018	3.51	9.44	0.0021	3.75	9.61	0.0019	3.90	9.95	0.0016
BIG5				0.73	0.41	0.5195									
SPECIALIST							0.06	0.01	0.9353				0.79	0.91	0.3402
BRA										1.18	2.75	0.0975	1.62	4.07	0.0436
SPECIALIST*BRA													-2.49	1.25	0.2627
McFadden R ²		0.49			0.49			0.49			0.51			0.52	
Model χ^2		67.61			68.02			67.61			70.51			72.23	

TABLE 7: LOGISTIC REGRESSION MODELS TESTING THE IMPACT OF AUDITOR TYPE AND CLIENT STRATEGIC ACTIONS ON TYPE II REPORTING ERRORS

Variables	Model 6			Model 7			Model 8		
	AUDITOR = BIG 5			AUDITOR = SPECIALIST			AUDITOR = BRA		
	coeff	χ^2	p-value	coeff	χ^2	p-value	coeff	χ^2	p-value
C	-14.11	10.63	0.0011	-17.43	16.49	0.0001	-15.88	13.79	0.0002
LNSALES	0.56	5.28	0.0216	0.67	7.66	0.0056	0.70	7.90	0.0049
ZSCORE	-0.76	11.35	0.0008	-0.74	12.54	0.0004	-0.73	11.24	0.0008
DEFAULT	-2.02	7.35	0.0067	-2.06	7.15	0.0075	-2.09	6.77	0.0092
SQBNKLAG	0.41	10.19	0.0014	0.43	12.42	0.0004	0.43	11.19	0.0008
RAISE\$	4.06	9.25	0.0024	3.57	8.44	0.0037	4.09	9.51	0.0020
AUDITOR	-0.70	0.09	0.7637	4.06	3.18	0.0746	-2.59	1.49	0.2220
OPERATING	0.37	0.01	0.9337	4.01	4.75	0.0293	-0.12	0.00	0.9455
STRATEGIC	-0.79	0.14	0.7094	1.48	3.37	0.0665	0.30	0.10	0.7567
OPERATING*AUDITOR	1.65	0.12	0.7249	-6.35	3.12	0.0775	5.76	2.90	0.0888
STRATEGIC*AUDITOR	2.22	0.93	0.3340	-2.33	1.75	0.1854	0.93	0.37	0.5423
McFadden R ²		0.53			0.56			0.56	
Model χ^2		73.69			77.34			77.27	

